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MR. WARD: I would like to congratulate Dr. Hamilton on his paper. It is an excellent example of research work literally coming down to earth and grappling direct with the problems of the farmer. Would it be asking too much to ask Dr. Hamilton to indicate how this information is going to be given back to the farmer and how he can be helped with his individual problems?

DR. HAMILTON: I have given some thought to that problem. It is one that exercised my mind in doing these surveys. Are they worth doing? They are worth while from the point of view of such institutions as the State Advances and the Banks who are advancing money on land. They are the first people who will make use of such data. When it comes back to how it will help the man who is farming his own land then I do not think the service we have at the moment is adequate for the purpose. I think that for this type of data to get across to the farmer we have to establish that two-way bridge which Mr. Burnard mentioned yesterday. Looking at the thing without any preconceived ideas I think that the only way that this could be got across to the farmer as an individual would be to have a group of extension people continuously in operation who would start out along the road and visit every farmer on that road and collect from him the data required to make such a survey, then on the next visit that data should be given back to the farmer analysed. In other words, he should be told, "Last year your average production per acre was 100 lbs. fat. The average of all farms on your soil type was 150 lbs. The difference between your methods and the methods of the average farmer of this type is that they are saving twice as much hay as you are doing, etc." I think that some such method would handle it effectively and that with the addition of farmer representation on management committees, such a scheme could be worked. I cannot see how else you can reach the farmer who is in need of the information. There are going to be lots of cases of men who are farming too small an area or who have not the necessary capital to step up production. Those are the sort of difficulties that I think we want to know about. How many people in this country are not increasing production because of lack of capital or because production per labour unit is at a maximum with a low intensity of farming?

GRAZING BEHAVIOUR OF DAIRY COWS IN NEW ZEALAND

By J. J. Hancock and N. M. Wallace,
Ruakura Animal Research Station, Hamilton.

SUMMARY:

Six sets of monozygotic twin heifers (first-calvers) were observed for six 24-hour periods at monthly intervals through the main lactation season with following results:-

The cows spent on an average 28% (range 26-32%) of their time grazing, 30% (range 24-35%) standing or walking not grazing, and 42% (range 39-45%) lying down. They walked on an average 3073 yards (range 2535-3474 yards).

58% of the grazing took place between 7 a.m. - 3 p.m. and 42% between 5 p.m. and 4.45 a.m.

Hot weather (maximum 77° F.) depressed somewhat the overall grazing time but did not influence the ratio of day to night grazing.

Only 3% of all defecations and 5% of all urinations were voided in the milking shed yard.

The "within set of twins" intraclass correlation was .9038 for grazing time, .1604 for the time of standing or walking not grazing, and .1896 for time spent lying down.

The correlation between the theoretical TDN requirement and grazing time of the 12 cows was .17.

Detailed observations were made on two sets of twins for one 24-hour period with following results:-

Average number of bites of grass per day: 23,500 with a rate of 51 per minute of effective grazing time. Average number of boluses 358 with an average of 48 bites per bolus. The two sets of twins showed wide variations in these respects.

DISCUSSION ON MESSRS HANCOCK'S AND WALLACE'S PAPER:

MR. WARD: I think this pioneering work of Mr. Hancock's is amazingly good work. I would like to ask him whether he found any differences between the cows in distances walked or foraging ability and whether the sward was of fairly even species content throughout so that, say, the high producing cows were not selecting their food better.

MR. HANCOCK: There were no differences in distance walked. As to the quality of the feed, the grass was uneven but there was always a good cover of rye-grass and clover. I cannot give you any indication as to whether some cows tended to select more than others. It is quite possible but not probable.

MR. CRAWFORD: I would like to agree with Mr. Ward on the importance of this work. It is one of the first pieces of work done on what our animals do when we are not watching them. I feel that much more will have to be done before we have an idea of how they spend their 24 hours and much important work will depend on the findings of that work. From Mr. Hancock's observations it would appear that where a dairy farmer has a small night paddock he should turn his cows into the day paddock after the evening milking and then return them to the night paddock before going to bed. If after three or four hours in the day paddock they were returned to the night paddock they would not lose much of their grazing period. Is that a reasonable interpretation of the graph?

MR. HANCOCK: I think Mr. Crawford is correct in supposing that the cows managed in that way will get in more grazing time.

DR. CAMPBELL: Mr. Hancock has pointed out that his data will be valuable with reference to many problems in animal husbandry. In relation to size and efficiency of production, I would like to ask him whether these animals were similar in size or whether there were marked differences in size between sets of twins and whether there are any points he noted in the relationship of any of his results to size differences?

MR. HANCOCK: Yes, there were quite big differences in size between sets of twins. 17 and 18 were 170 lb. heavier than 11 and 12. In spite of the big differences in weight and productive capacity T.11, T.12, grazed for approximately the same length of time as T.17 and T.18.

DR. WALLACE: I should like to ask Mr. Hancock whether New Zealand cows show any marked differences in respect of such characteristics as distances walked, time spent grazing during the day and night, number of urinations, as compared with the findings in the United States where, I understand, work was done with beef cows principally and where, I think, the same general approach was adopted.

MR. HANCOCK: I think that the work Dr. Wallace refers to consisted of observations on our nursing beef cow for four 24 hour periods with varying amounts of grass in the paddock whereas we attempted to observe the grazing habits of different cows on